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ABSTRACT

Subjects in this study of the learning environment in a rural school and an urban school were students of 96 classrooms, 47 of which were in rural areas and the remaining 50 in urban areas. Half the students were administered the Learning Environment Inventory and the other half took the Test of Primary Mental Abilities. Results indicate that rural and urban classrooms, in general, have measurably different learning climates, with significantly more cohesive structures being prevalent in rural classrooms than in urban classrooms. Furthermore, rural classrooms are characterized by cliques, disorganization, competitiveness, and limited student satisfaction. Whereas urban classrooms are characterized by environment, challenge and satisfaction. Superior material resources, challenging courses and satisfaction with the learning situation are typical of urban classrooms. The authors stress the need for the eradication of these existent disparities in order to improve the quality of educational services for all children. (Author/HMV)

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In the thirties, Lewin (1936) suggested that behavior is the resultant of two interdependent vectors--person and environment--operating in a dynamic field of "life-space". Similarily, Brunswik (1957) pointed out that all aspects of physical environment are potentially relevant to learning, while Walberg (1970) stated that much of the reliable variance in student performance, is attributable to the aptitude of the learner and the environment of learning, leaving only a small part to be accounted for by instructional variables and perhaps by interactions between the three factors. In view of the importance of environment as a manipulable factor in learning, the locus of interest in educational measurement is beginning to shift from measures of the individual to measures of the environment.

In the last few years a number of scales for assessment and evaluation of learning environments have been developed and constructed for different institutional levels. Based on the concept proposed by Murray (1938), Stern, Stein, and Bloom (1956) elaborated the environmental press concept by applying it to assessment studies and demonstrated that an improvement in the prediction of performance was possible by defining the psychological demands of the situation in which the performance takes place. Using Murray's classification of needs as a model, Stern (1958) constructed several experimental editions of a needs inventory, called the Activities Index. More recently Sinclair (1969) developed the Elementary School Environment Survey for identifying various aspects of environmental press in the elementary school.

Perhaps the most recent development has been based on the Getzels' and [illegible]en's (1960) theoretical model of the class as a social system. A series

of research and evaluation studies was carried out by Harvard Project Physics using secondary school physics classes (see Anderson, 1970a, 1971a; Anderson, Walberg, & Welch, 1969; Walberg, 1968b, 1969a, 1969b, 1969c; Walberg & Anderson, 1968). For the first few studies of Harvard Project Physics, the instrument used for assessing the pupil's perception of learning environment was Classroom Climate Questionnaire (CCQ) (see Walberg, 1969b). This scale was quickly followed in 1969 by psychometric studies (Walberg, 1969b, p. 444) which found that the CCQ scales were unreliable and redundant, and work began immediately on an instrument called Learning Environment Inventory (LEI).

With the advent of the Learning Environment Scales and other similar instruments questions were asked regarding whether the pupils react uniformly among the various grade levels for every academic subject in a classroom learning situation. An investigation was made at the secondary level by Yamamoto, Thomas, and Karns (1969) who were concerned with pupil perceptions of various aspects of the school including subject matter. Using 800 sixth- through ninth-graders (100 in each sex in each grade) Yamamoto et al. studied the attitudes of the students towards four courses (social studies, language, science, mathematics) and four people (classmates, parent, teacher, and the pupil himself). No overall sex differences were detected, and there was a monotonic decrease in the favorableness of rating on both curriculum and people as the grade level increased.

Yamamoto, Thomas, and Karns (1969) also reported that there were grade and pupil sex interactions. In general, mathematics and science courses had equal and high scores on Vigor (alive--dull, large--small, strong--weak, fast--slow), whereas social studies and languages were rated significantly lower. The certainty concepts (safe--frightening, easy--difficulty, usual--unusual, familiar-strange), were highest for language as compared with mathics; social studies and science, respectively. In general, mathematics

and science courses had equal and high scores on Vigor (alive--dull, large--small, strong--weak, fast--slow), whereas social studies and languages were rated significantly lower. The certainty concepts (safe--frightening, easy--difficulty, usual--unusual, familiar--strange), was the highest for language as compared with mathematics, social studies and science, respectively.

Anderson (1971a) investigated the relationship of teacher sex and course content on 15 dimensions of the classroom learning climate. In science, mathematics, humanities, and French classes, Anderson (1971a) administered the 15 scales of the Learning Environment Inventory (LEI) in an attempt to describe the classroom climate as perceived by pupils to one another, to the organizational properties of the class, to class activities, and to the physical environment.

Anderson's study showed that neither teacher sex nor its interaction with course content produced a statistically significant effect on classroom learning climate. Course content itself, however, revealed three statistically significant dimensions of discrimination. The first discrimination axis separated mathematics classes from the others, on the second axis, humanities were at one extreme with science at the other; French classes were separated from the rest on the third axis. Mathematics classes were characterized by high friction, favoritism, difficulty, cliqueness, disorganization, and low formality and goal direction. Science classes were perceived as formal and fast-moving with little friction, cliqueness, and disorganization. Humanities classes were paced and "easy" as compared to classes in science and mathematics. French groups without high levels of friction or disorganization.

In another related study Olson (1971) investigated eleven different variables simultaneously, among them, subject taught, class size, grade level, type of teacher, and sex of teacher. Subject taught, class size, grade level and type of teachers were found to have a significant relationship

with the quality of the educational activity; on the other hand, four other variables, including sex of the teacher, were found to be insignificant as predictors of the quality criterion. The discerning reader should note, however, that this study was rather sketchily reported, and, therefore, should be interpreted accordingly.

It is interesting to note that both Anderson (1971a) and Olson (1971) suggest that teacher sex is unrelated to pupils' perceptions of the learning climate within their classes and to be insignificant as a predictor of general quality of educational process in any schoolroom. A contrary result is reported by Ryans (1960) who found that male and female teachers have different effects on the subject matter being taught. Generally, Ryans (1960) observed that women teachers had more favorable attitude towards pupils, democratic classroom practices, permissive educational viewpoints, and verbal understanding. Men teachers scored significantly higher with respect to emotional stability than did women teachers in the secondary school.

It should be noted that none of the above studies examined rural-urban differences in learning environment. Randhawa & Fu (1973) point out that a considerable amount of material has been written about rural pupils and the situation which has caused the pupils in rural areas to become disadvantaged, but little of it has been based on research. Studies generally have dealt with income per capita, indicating that rural incomes did not match urban income per capita, and, as such, rural residents were disadvantaged in terms of the larger society (Jenkins, 1963; Taylor & Jones, 1963).

Other studies (Baughman and Dahlstrom, 1968) have indicated a relationship between the child family and his intellectual performance. Marjoribanks (1972) developed a scale to assess the learning environment of the home. The measures of learning environment as a set, produced significant multiple relations with each of the four subscale and total scores of the Primary

Mental Abilities Test. Similar results on the relationship between the various aspects of the gross classificatory measures of the environment and the mental abilities were reported by Ausubel (1968), Fraser (1959), and Nisbet (1953). However, the replication of Marjoribanks' study across various developmental levels and involving both male and female Ss could provide much-needed useful information to understand the effect of environmental circumstance on intellectual development.

It is reported that socioeconomic status of rural youth plays an important part in aspirations. Taylor and Jones (1963) stated that, when emphasis on formal education was lacking, as in farm families, the youth involved did not perceive education as a dominant value and consequently were not motivated to obtain education. Still other studies in comparing the rural youth from a higher socioeconomic level with rural youth from a lower socioeconomic level, (Sperry et al. 1965; Taylor and Jones 1963), indicated that rural youth from a higher socioeconomic level had higher educational aspirations and took greater advantage of educational opportunities than rural youth from lower socioeconomic levels.

A number of studies (Ackerson, 1967; Edington, 1971; Lamanna & Samora, 1967) have shown that rural or urban residence is strongly related to educational status. Urban residents are almost always better educated than rural residents, regardless of sex, age, maturity, race or parentage. On the other hand, rural pupils are characterized by poor educational achievement as compared with urban pupils (Edington, 1971).

The present study was an attempt to test the following null hypotheses:

1) There will be no significant differences in the mean vectors in environmental and intellectual variables for science, mathematics, social studies, and English classes.

2) Rural classes will have the same mean vector as the urban classes on the

dependent variables.

3) The mean vector of the grade 8 classes will be the same as that of the grade 11 classes on the dependent variables.

4) There will be no significant interaction between grade levels and subjects.

Method

Sample.-- Ninety-six classrooms in the province of Saskatchewan in 1972 were selected. Forty-six of these were grade 8 and 50 grade 11 classrooms. Forty-seven of these classrooms were from rural schools and the remaining 50 were from urban schools. The selected classrooms represented only one of the four subjects; mathematics, science, English, or social studies. The sex of the teacher, responsible for the selected subject in the particular grade, was also identified.

Procedure.-- It should be noted that the sampling unit for the present study was the classroom. This practice though highly desirable and advisable is rarely followed in research in education. Some of the notable exceptions have been the investigations by Anderson (1971a), by Olson (1971), and Walberg (1968b, 1969a, 1969b, 1969c).

The students in each classroom were randomly divided into two groups in accordance with the suggestion for such randomization by Walberg and Welch (1967). The Learning Environment Inventory (LEI) (Anderson, 1971b) and the Primary Mental Abilities Test (PMA) were administered in each classroom so that one-half of the class took the LEI and the other half of the class took the PMA. The 15 scales of the LEI are identified as cohesiveness, diversity, formality, speed, environment, friction, goal direction, favoritism, difficulty, apathy, democratic, cliqueness, satisfaction, disorganization, and competitiveness. Anderson (1971b) has provided available reliability and validity data on the LEI scales. The PMA yields four subscores on verbal meaning, number facility, reasoning, and spatial relations as well as the total score. For the purposes

of this study, the PMA raw scores were converted into the corresponding deviation IQs.

Analysis and Results

The data on the 20 dependent variables were first analyzed using a four factor multivariate and univariate analysis of variance (MANOVA & ANOVA) design. The purpose of this analysis was to ascertain primarily the effect of teacher sex as well as its interaction with course content on the social and intellectual climate of the classroom. Neither teacher sex main effect nor any of its interactions with course content, locale (rural and urban) and grade level approached significance at the .05 level. These results are consistent with Anderson's (1971a) which showed that neither teacher sex nor its interaction with course content produced statistically significant effect on classroom learning climate. Also, one of the cells in the design for the present analysis was empty. Therefore the data were reanalyzed in a fixed three factor design after dropping teacher sex as an independent variable. This design along with cell frequencies is illustrated in Table 1.

Insert Tables 1 and 2 about here

Observed means for the three main classifications are given in Table 2.

A summary of MANOVA and ANOVA results is given in Table 3. Contrary

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Insert Table 3 about here

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to Anderson's (1971a) finding that course content produced significant effect on the learning environment of the classroom it was found that course content does not effect the learning environment of the classroom generally (non-significant multivariate main effect). However, the ANOVA results

indicated that course content effects only the cohesiveness of the classroom significantly ($F(3,80) = 3.20$, $p < .05$). Multiple comparisons on this variable were made using Scheffe (1959) method. It was found that mathematics and social studies classrooms had significantly higher means on cohesiveness than English classrooms. This finding is inconsistent with Anderson's (1970a). He found that classes in history and English were more cohesive than those in the sciences, including mathematics. It is also reported that class cohesiveness related to learning criteria differentially depending upon the norms of the cohesive class (Anderson, 1970b). Furthermore, cohesive classes sanction only goal-directed behavior; if the group norm includes learning, cohesiveness contributes to increased learning; for non-learning oriented classes, cohesiveness acts against those pupils who want to learn. Also, this LEI variable has been shown to relate to three major class and course properties including the one discussed above. Small classes are more cohesive than larger classes, particularly when the class contains fewer than 16 pupils (Anderson & Walberg, 1971; Walberg, 1969d; Walberg & Ahlgren, 1970), and classes of teachers inexperienced with a new course are perceived as more cohesive than those taught by teachers familiar with the course (Anderson, Walberg, & Welch, 1969). The fact remains, however, that course content is related to the cohesiveness of the class and this effect could be linked to many other variables.

The multivariate test of the locale main effect was significant ($F(20,61) = 2.01$, $p < .05$) which shows that the rural and urban classrooms had significantly different mean profiles on the 20 variables. The ANOVA results showed that only on cohesiveness the rural classrooms were significantly more cohesive than the urban classrooms ($F(1,80) = 14.86$, $p < .05$). An examination of the standardized discriminant function coefficients indicates that rural classrooms are characterized by cohesiveness, cliqueness, disorganization, and competitiveness. Whereas, urban classrooms are characterized

by environment, difficulty, and satisfaction.

The learning environments in grades 8 and 11 classrooms were significantly different ($F(20,61) = 18.78$, $p < .05$). Twelve of the 15 LEI variables as shown in Table 3 produced significant univariate F-ratios ($p < .05$). All of the 12 significant LEI variables had higher means for grade 8 than grade 11 classes. However, the ANOVA results on the PMA scores showed that grade 11 classes had significantly higher means on number facility and total IQ. It is interesting to note that means on the 14 LEI variables for grade 8 were higher than grade 11 classes and on democratic scale means were equal. However, on all the PMA scores, grade 11 classes had higher means than grade 8 classes. The above differences cannot be attributed entirely to the covariation effect because in a separate analysis controlling for the four PMA subscores almost similar results were obtained.

The MANOVA second and third order interactions were all non-significant. However, the univariate ANOVA produced a significant course content x grade interaction on apathy ($F(3,80) = 3.18$, $p < .05$). This intereaction is illustrated in Fig. 1. It is indicated by these data that apathy relates to

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Insert Figure 1 about here

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course content differentially depending upon the grade placement of the learners. Since mathematics classes have been found to be highest on cohesiveness and apathy, it would appear that grade 8 students particularly will have lesser affinity with class activities. Therefore, the teaching of mathematics in grade 8 provides a significant challenge to the teachers.

Also locale x grade interaction was significant for friction ($F(1,80) = 7.54$, $p < .05$) and competitiveness ($F(1,80) = 5.92$, $p < .05$). These interactions are illustrated in Figures 2 and 3. Friction and competitiveness are

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Insert Figures 2 and 3 about here

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related to grade placement of learners depending upon the locale. These two variables seem to be sensitive to the size of the school and the extent of intimacy and neighborliness that prevail in the classroom and community interactions. Generally grade 8 classrooms are comprised of students who come from the community where the pupils have more intimate contact after school and partake in other activities in the community. On the other hand grade 11 students attend the central collegiates where the possibilities of prior social contacts are limited.

Discussion

Educators often claim that the quality of an educational experience is less closely related to the content of the subject matter learned than to the method or process of learning. Many of the new science and mathematics courses seem particularly relevant to disciples of student-centered instruction. It is an encouraging trend in evaluation studies that pupils' perception of their learning environment are assessed.

The class is a dynamic group. The context in which the class is embedded is a significant determinant of the learning environment. The context in this report implies all the independent variables that determine the learning environment singly, collectively, or interactively. However, no single study can exhaustively determine the various associated functions on which the learning environment is dependent. The present study has uncovered only a few of the many possible functions which are predictive of the learning environment.

Consistent with the results of an attitude study by Yamamoto, Thomas, and Karns (1969) the social environment scores of grade 8 were systematically

higher than grade 11 students. However, the intellectual environment (PMA) scores were in the reverse order. This phenomenon could be explained by several factors. Firstly, systematic elimination of students after grade 8 from the selected courses due to the availability of non-academic streams in the high schools for those students who are not academically inclined and less able would account for the differences on the PMA scores. Secondly, developmental differences in grade 8 and grade 11 students would suggest some differences in their response styles on the LEI and in test wiseness on the PMA. Thirdly, differences in the perceptions by individuals of the learning environment with different intellectual capacities may be another factor. Since controlling for PMA similar results were obtained on the LEI variables; therefore, the grade effect cannot be explained totally by the covariation effect. Hence, grade 8 and 11 classrooms provide significantly different learning climate which on apathy scale is highly dependent on course content and on friction and competitiveness scales is related to locale.

Rural and urban classrooms in general have significantly different learning climate. Significantly more cohesive structures are prevalent in rural classrooms than in urban classrooms. Further, rural classrooms are characterized by cliqueness, disorganization, and competitiveness. Whereas urban classrooms are characterized by environment, difficulty, and satisfaction. Superior material resources, challenging courses and satisfaction with the learning situation are typical of urban classrooms. Rural classrooms provide for intimate relationships among the class members and a facilitative atmosphere for the formation of splinter groups. The classes in the rural settings are perceived as disorganized and less satisfying. The existing disparity in the rural and urban situations in terms of materials and personnel should be eradicated so that equality of educational services is guaranteed to all the children. Urgent steps are needed to make the rural settings attractive for

the educational personnel of high calibre to narrow the gap in the provision of equal educational opportunity.

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TABLE 1

Cell Frequencies in the Three Factor Design

	Locale			
	Rural		Urban	
Course/Grade	8	11	8	11
Mathematics	6	5	6	6
Science	6	4	6	6
English	6	7	5	10
Social Studies	5	7	6	4

TABLE 2

Observed Means for the Main Classifications

Variable	Subject				Locale		Grade	
	Mathematics	Science	English	Social Studies	Urban	Rural	8	11
1. Cohesiveness	19.6	19.2	19.0	19.5	19.0	19.7	19.4	19.2
2. Diversity	20.6	20.7	20.8	20.9	20.7	20.9	21.1	20.5
3. Formality	18.7	18.4	18.2	18.3	18.2	18.6	19.0	17.9
4. Speed	17.7	17.3	17.4	17.5	17.3	17.6	17.7	17.2
5. Environment	17.3	17.1	16.4	17.0	17.1	16.6	17.3	16.5
6. Friction	18.2	18.8	18.6	18.1	18.4	18.5	19.5	17.5
7. Goal Direction	17.8	17.5	17.2	17.4	17.4	17.5	17.8	17.1
8. Favoritism	15.7	15.6	15.2	15.4	15.4	15.5	16.0	14.9
9. Difficulty	19.7	19.5	19.7	19.5	19.8	19.5	19.7	19.5
10. Apathy	17.0	16.4	16.5	16.6	16.5	16.8	16.9	16.4
11. Democratic	16.6	17.0	16.7	16.8	16.8	16.7	16.8	16.8
12. Cliqueness	16.8	16.7	16.7	16.5	16.6	16.8	17.2	16.3
13. Satisfaction	16.8	16.9	16.7	16.4	16.7	16.6	17.1	16.3
14. Disorganization	18.8	19.1	18.8	18.8	18.7	19.0	19.2	18.5
15. Competitiveness	18.3	18.2	17.7	18.0	17.9	18.2	18.3	17.8
16. Verbal Meaning	106.7	107.4	109.7	109.3	110.3	106.5	106.3	110.4
17. Number Facility	113.2	112.6	112.2	114.2	114.3	111.6	110.0	115.8
18. Reasoning	112.4	113.3	113.8	113.7	114.5	112.2	112.4	114.2
19. Spatial Relations	105.0	108.7	108.1	107.5	107.7	107.1	107.0	107.8
20. Total IQ	108.5	110.2	111.4	111.4	112.0	108.8	107.1	113.5

TABLE 3

Summary of MANOVA and ANOVA Results on the Twenty Dependent Variables

Source	Multivariate F-ratio (df_h,df_e)	Dependent Variables which had significant* F-ratio in ANOVA
Course Content (A)	n.s.	1
Locale (B)	2.01* (20,61)	1
Grade (C)	18.78* (20,61)	2-8,10,12-15,17,20
A x B	n.s.	--
A x C	n.s.	10
B x C	n.s.	6,15
A x B x C	n.s.	--

* Significant at the .05 level.

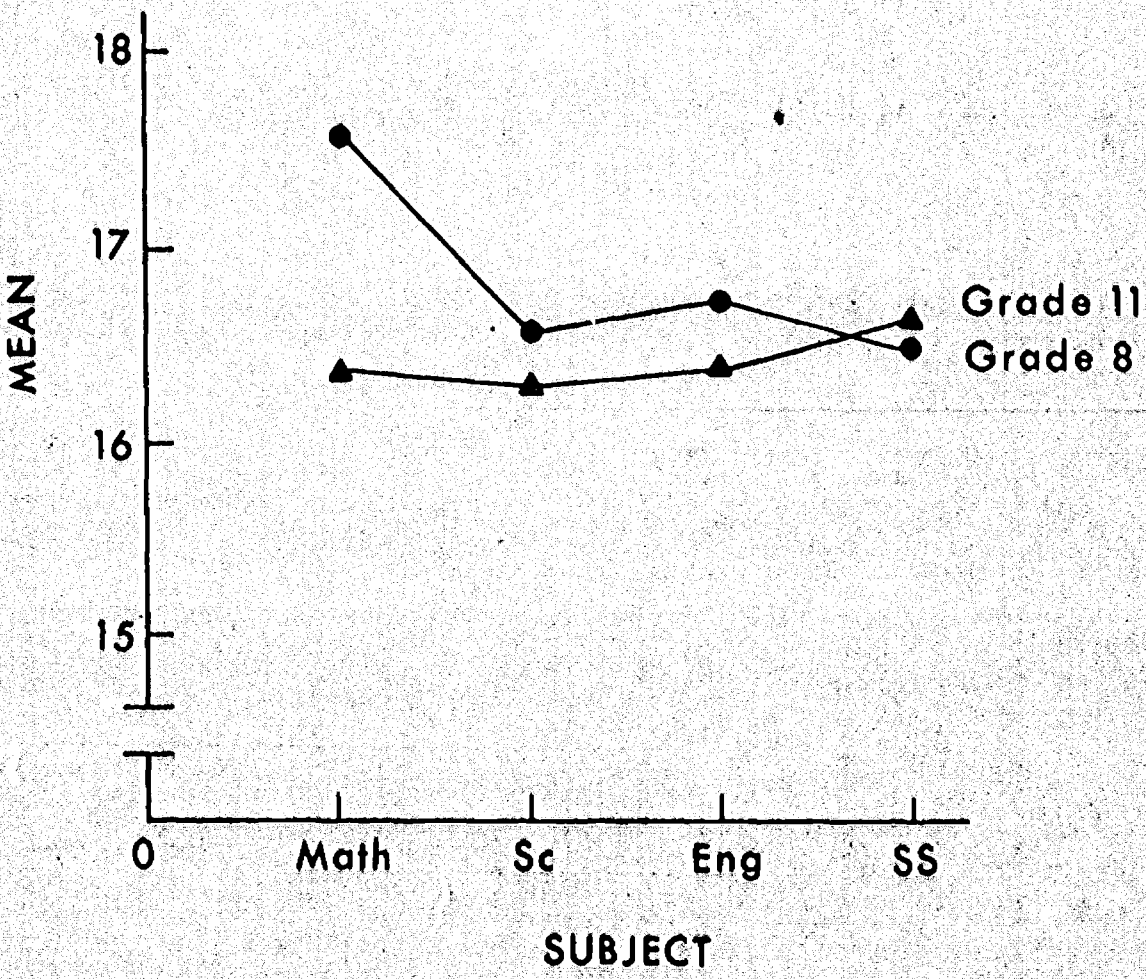

Fig. 1 Subject X Grade Interaction on Apathy

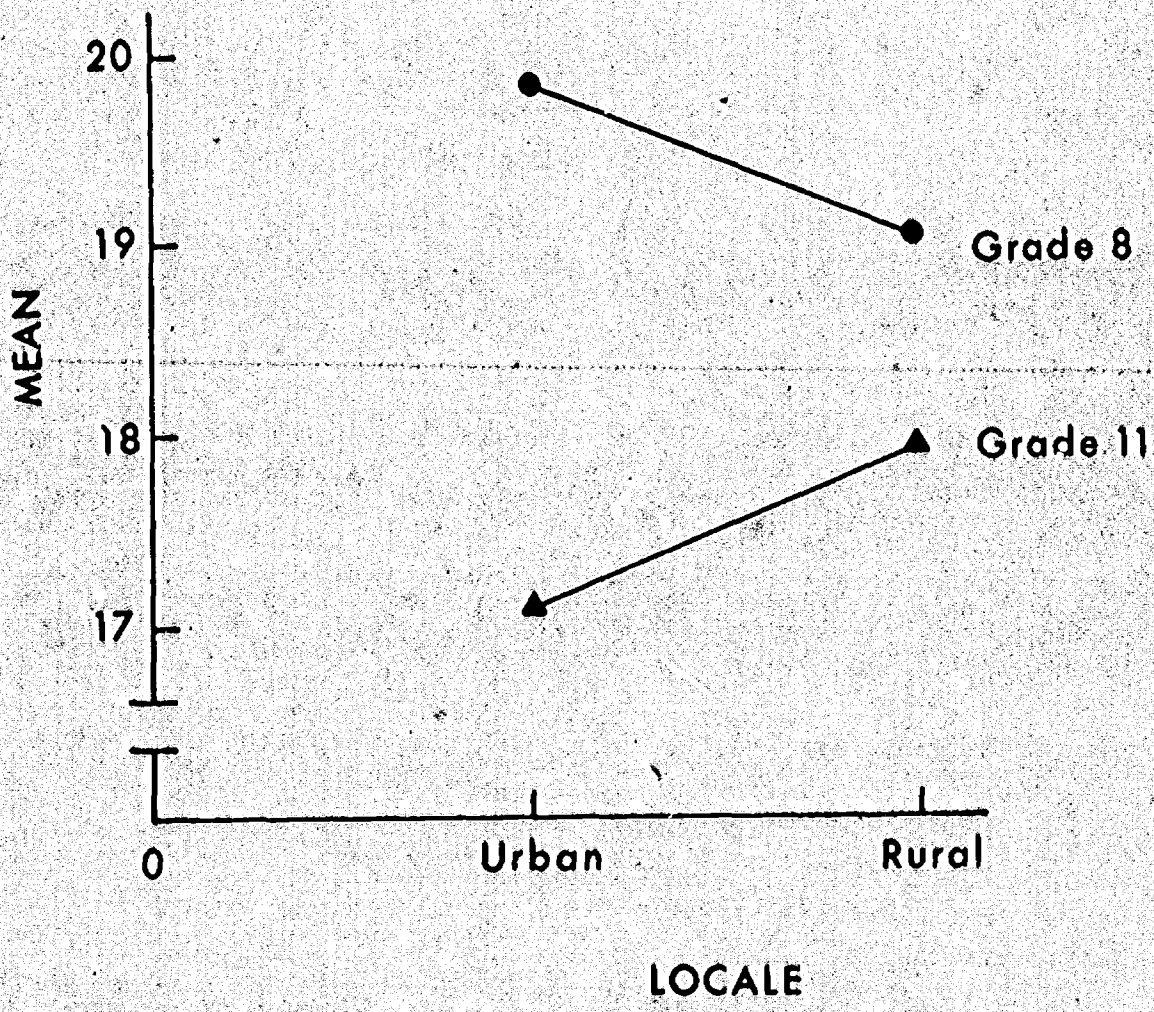

Fig. 2 Locale X Grade Interaction on Friction

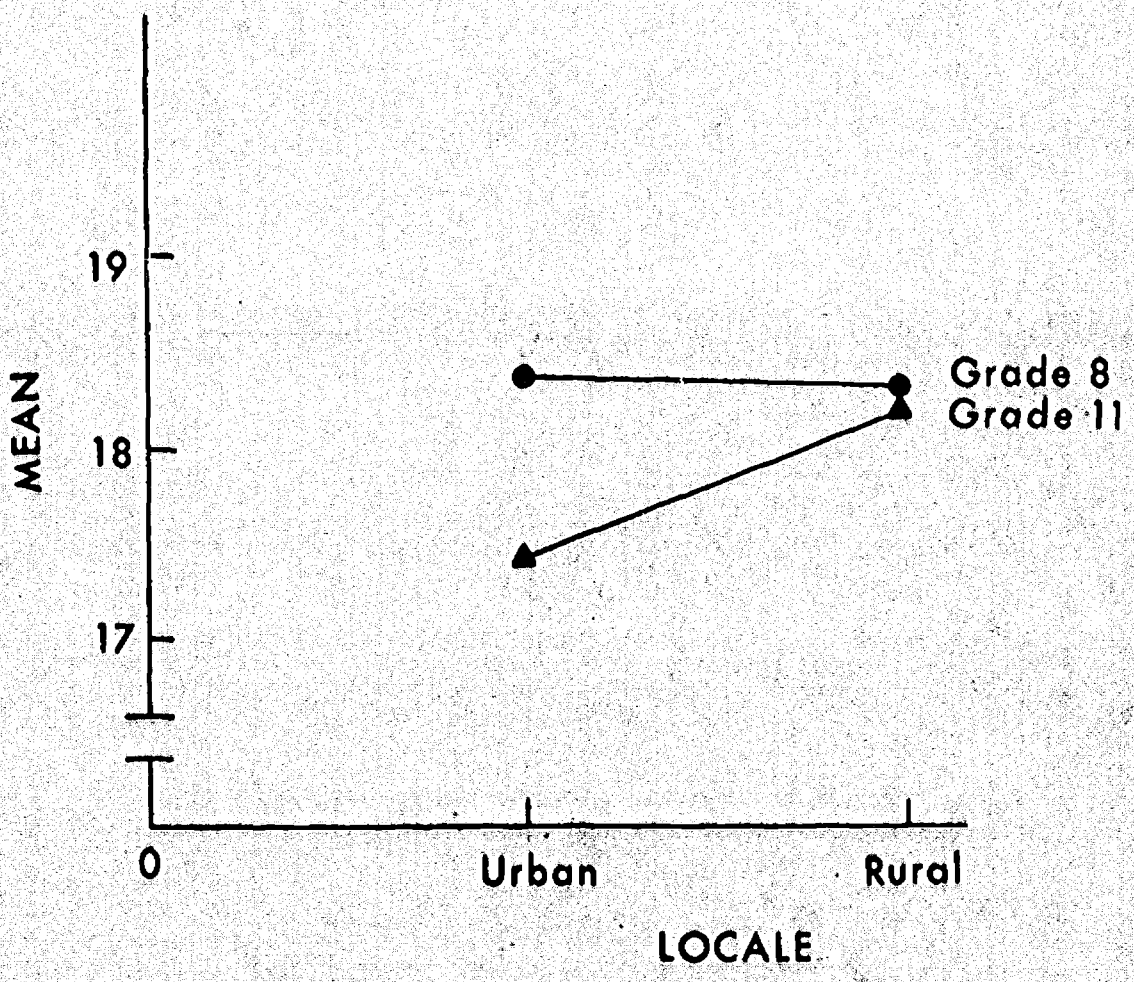

Fig. 3 Locale X Grade Interaction on Competitiveness